

What Is Claimed Is:

1. An isolated polynucleotide selected from the group consisting of:

(a) a polynucleotide encoding an enzyme comprising an amino acid sequence selected from the group of amino acid sequences set forth in SEQ ID NOS:28-36;

(b) a polynucleotide which is complementary to the polynucleotide of (a); and

(c) a polynucleotide comprising at least 15 bases of the polynucleotide of (a) or (b).

2. An isolated polynucleotide selected from the group consisting of:

(a) SEQ ID NOS:19-27, 37-41, 43, 45, 47, 49, 51, or 53;

(b) SEQ ID NOS:19-27, 37-41, 43, 45, 47, 49, 51, or 53, where T can also be U; and

(c) fragments of a) or b) that are at least 15 bases in length and that will hybridize to DNA which encodes the amino acid sequence of any of SEQ ID Nos:28-36, 42, 44, 46, 48, 50, 52, or 54.

3. The polynucleotide of Claim 1 wherein the polynucleotide is DNA.

4. The polynucleotide of Claim 1 wherein the polynucleotide is RNA.

5. An isolated polynucleotide comprising a polynucleotide having at least 70% identity to a member selected from the group consisting of:

(a) a polynucleotide encoding an enzyme encoded by the DNA contained in ATCC Deposit No. 97379, wherein said enzyme is selected from the group consisting of Ammonifex degensii KC4, Aquifex VF-5, M11TL, Methanococcus igneus KOL5, Thermococcus AED112RA, and Thermococcus celer, Thermococcus CL-2, and Thermococcus GU5L5.

(b) a polynucleotide complementary to the polynucleotide of (a); and

(c) a polynucleotide comprising at least 15 bases of the polynucleotide of (a) and (b).

6. A vector comprising the DNA of Claim 1 or Claim 2.

7. A host cell comprising the vector of Claim 6.

8. A process for producing a polypeptide comprising: expressing from the host cell of Claim 7 a polypeptide encoded by said DNA and isolating the polypeptide.

9. A process for producing a recombinant cell comprising: transforming or transfecting the cell with the vector of Claim 6 such that the cell expresses the polypeptide encoded by the DNA contained in the vector.

10. An enzyme of which at least a portion is coded for by a polynucleotide of claim 1, and which is selected from the group consisting of:

(a) an enzyme comprising an amino acid sequence which is at least 70% identical to an amino acid sequence selected from the group of amino acid sequences set forth in SEQ ID NOS:28-36; and

(b) an enzyme which comprises at least 30 amino acid residues to the enzyme of (a).

sub
B³

11. An enzyme of which at least a portion is coded for by a polynucleotide of claim 1, and which is selected from the group consisting of:

(a) an enzyme comprising an amino acid sequence selected from the group of amino acid sequences set forth in in SEQ ID NOS:28-36, 42, 44, 46, 48, 50, 52, or 54; and

(b) an enzyme which comprises at least 30 amino acid residues to the enzyme of (a).

12. A method for hydrolyzing phosphate bonds comprising:

administering an effective amount of an enzyme selected from the group consisting of an enzyme having the amino acid sequence selected from the group of amino acid sequences set forth in SEQ ID NOS:28-36, 42, 44, 46, 48, 50, 52, or 54.

sub
a¹

~~add H₆~~ add H₆

Add H₆